

Rocks and Minerals Review Guide

Minerals

- ~~1. What is an element? What is an atom? What are the subatomic particles of the atom and their charges?~~
- ~~2. What are ions? What are isotopes?~~
- ~~3. Why do atoms bond? What subatomic particle is involved in bonding? What energy level is involved in bonding? When atoms bond, what is formed?~~
- ~~4. Describe the three types of bonds.~~
5. What are the 5 characteristics of minerals? List the 4 processes of mineral formation.
 - Naturally occurring, inorganic, definite chemical composition, crystalline structure, solid
 - Crystallization from magma, precipitation, changes in pressure and temperature, hydrothermal solutions
6. What are the 6 major mineral groups? How are all minerals classified?
 - Silicates, carbonates, oxides, sulfates & sulfides, halides, and native elements
 - Based on their composition
7. What 2 elements do all silicates have? What structure do they form? Give 2 examples of silicates.
 - Silicon and oxygen
 - Tetrahedron
 - Quartz, augite, hornblende, micas, feldspar
8. What are the various structures that silicates will form?
 - Single tetrahedron, single chain, double chains, sheets, three-dimensional networks
9. What elements do carbonates have? Give 2 examples of carbonate minerals.
 - Carbon, oxygen, one or more metallic elements
 - Calcite, dolomite
10. What are oxides? Give 2 examples of oxides.
 - Minerals that contain oxygen and one or more other elements, which are usually metals
 - Rutile, corundum, hematite
11. If a mineral contains sulfur, what mineral group does it belong to? Give an example.
 - Sulfates & sulfides
 - Anhydrite, gypsum, galena, sphalerite, pyrite
12. For a mineral to be classified as a halide, what does it need to have? To what group, from the Periodic Table, do these elements belong?
 - Fluorine, chlorine, bromine, iodine
 - Group 17
13. What is a native element? Give some examples.
 - Group of minerals that exist in pure form
 - Gold, silver, copper, sulfur, carbon (graphite)
14. List and describe the properties used to identify minerals.
 - Color – easy to see, not useful to help identify
 - Streak – color of the powder created when mineral is rubbed on an unglazed porcelain plate
 - Luster – describes how light is reflected from its surface
 - Crystal form – visible expression of a mineral's internal arrangement of atoms
 - Hardness – resistance of a mineral to being scratched
 - Cleavage – tendency for a mineral to break along flat surfaces
 - Fracture – if breaks are not along flat, even surfaces
 - Density – ratio of an object's mass to its volume
15. When testing for hardness, what is the rule used to help determine the hardness? What is the name of the scale used for hardness? What is the hardest mineral and its hardness number? What is the softest mineral and its hardness number?
 - If mineral A will scratch mineral B, then mineral A is harder.
 - Moh's hardness scale

- Diamond = 10
- Talc = 1

16. Why does cleavage occur?

- The internal arrangement of the atoms allows for cleavage to occur

Rocks

1. What is a rock? What is the rock cycle?

- Solid mass of mineral or mineral-like matter that occurs naturally as a part of our planet
- Transformation of one type of rock to another

2. What are the 3 types of rocks? Describe several ways a rock can move through the rock cycle.

- Igneous, sedimentary, metamorphic
- Igneous to sedimentary = compaction and cementation, sedimentary to metamorphic = heat and pressure, metamorphic to igneous = melting and cooling

Weathering and Erosion

1. What are the 2 types of weathering?

- Mechanical and chemical

2. What are the 4 types of mechanical weathering? Briefly describe each.

- Frost wedging – water seeps into cracks in rocks – when water freezes, it expands and breaks rock apart
- Unloading – slabs of outer rock separate like layers of an onion and break loose
- Biological activity – plants and animals change the shape
- Abrasion – physical hitting of two objects, caused by wind and water – example: waves crashing on the beach (the force of the water hitting the shore slowly changes the shape of the shore)

3. What are the 3 types of chemical weathering? Briefly describe each.

- Solution -the dissolving of solid rock material in water
- Oxidation - also known as rusting; greatly speeds up in the presence of water and warm temps
- Hydrolysis - a permanent chemical combination with water

4. What are 3 factors that affect the rate of weathering?

- Surface area
- Climate
- Parent Material